

Attachment A

1. (Amended) A method for mounting an optical subassembly of an optical reading device to an image sensor subassembly of an optical device, said method comprising the steps of:

moving said optical subassembly and said image sensor subassembly in proximity with one another; and

soldering said optical and image sensor assemblies together using a solder material, wherein [immediately prior to] at the time of said soldering step there is no contact between said optical subassembly and said image sensor subassembly that prevents free movement of said optical subassembly and said image sensor subassembly in either of [the x or y directions] a vertical or a horizontal direction.

11. (Amended) The method of claim 1, further comprising the step of forming a first solderable surface on one of said subassemblies and a second solderable surface in said other of said subassemblies, wherein said first solderable surface is [in] made in the configuration of a pin driving a substantially uniform-diameter body, and said second solderable surface is made in the configuration of a through-hole, wherein said pin [body] has a diameter smaller than said hole to allow positional adjusting of said optical subassembly relative to said image sensor subassembly.

13. (Amended) A method for mounting an optical subassembly to an image sensor subassembly, said method comprising the steps of:

forming at least one solderable surface on at least one of said optical and image sensor subassemblies;

moving said optical subassembly in proximity with said image sensor subassembly to define an interface delimited by said at least one solderable surface of said optical subassembly or said image sensor subassembly; and

soldering said optical subassembly and said image sensor subassembly together at said interface, wherein said optical subassembly and said image sensor subassembly are configured so that said image sensor subassembly and said optical

subassembly can be moved freely relative to one another in at least either of [an x or y] a vertical or a horizontal direction immediately prior to said soldering step.

22. (Amended) The method of claim 13, wherein said forming step includes the step of making a first solderable surface in one of said subassemblies and a second solderable surface in said other of said subassemblies, wherein said first solderable surface is made in the configuration of a pin having a substantially uniform-diameter body, and a said second solderable surface is made in the configuration of a through-hole having a diameter larger than said [pin] body.

26. (Amended) An image sensor subassembly comprising:
a substantially rigid member;
an image sensor chip disposed on said substantially rigid member; [and]
a solderable surface formed on said substantially rigid member, said solderable surface being of a configuration selected from the group consisting of a hole[,] or pin[, or threaded screw] for receiving in surrounding but not engaging relationship a corresponding pin or hole; and a solder material disposed between said pin and said hole.

45. (Amended) The method of claim 1, wherein said method further comprises the step, after said moving step, of aligning said optical subassembly and image sensor subassembly using a video monitor which displays an output indicative of an output of said image sensor subassembly.

46. (Amended) A method for making an optical and image sensor assembly, said [and] image sensor assembly comprising an optical image sensor subassembly and an image sensor subassembly, said method comprising the steps of:

aligning said optical subassembly and said image sensor subassembly relative to one another without contacting said optical subassembly and said image sensor subassembly against one another in a manner that prevents free movement of

said [assemblies] subassemblies relative to one another in either of [the x direction or y directions] a vertical or a horizontal direction; and

when said optical subassembly and said image sensor assembly are properly aligned, securing said optical subassembly and said image sensor subassembly together.

47. (Amended) The method of claim 46, further comprising the step of forming a solderable surface on at least one of said optical [subassemblies] subassembly or said image sensor [subassemblies] subassembly, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

48. (Amended) The method of claim 46, further comprising the step of forming a solderable surface on at least one of said optical [subassemblies] assembly or said image sensor [subassemblies] assembly, wherein said forming step includes the step of overmolding non-solderable material onto solderable material to form said solderable surface, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

49. (Amended) The method of claim 46, further comprising the step of forming a solderable surface on at least one of said optical or image sensor [subassemblies] subassembly, wherein said forming step includes the step of plating a solderable material onto a non-solderable material, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

50. (Amended) The method of claim 46, further comprising the step of forming a solderable material on at least one of said optical or image sensor [subassemblies] subassembly, wherein said forming step includes the step of insert molding solderable material in non-solderable material, and wherein said securing

step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

52. (Amended) The method of claim 46, further comprising the step of forming a solderable surface on at least one of said optical [subassemblies] subassembly or said image sensor [subassemblies] subassembly, wherein said forming step includes the step of making said solderable surface in an irregular configuration having an increased surface area per unit three dimensional space relative to that of a smooth surface, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

56. (Amended) The method of claim 46, further comprising the step of forming a first solderable surface on one of said [subassemblies] optical subassembly or image sensor subassembly and a second solderable surface in said other of said [subassemblies] optical subassembly or image sensor subassembly, wherein said first solderable surface is made in the configuration of a pin, and said second solderable surface is made in the configuration of a hole, wherein said pin has a diameter smaller than said hole to allow positional adjusting of said optical subassembly relative to said image sensor subassembly, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

57. (Amended) The method of Claim 46, further comprising the steps of forming a solderable pin on one of said [subassemblies] optical subassembly on image sensor assembly, and making a hole for receiving said pin on the remaining of said subassemblies, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

59. (Amended) An imaging device comprising:

an image sensor subassembly including an image sensor mounted on a printed circuit board;

[an] a substantially rigid optical subassembly, said optical subassembly including an optical element disposed on a substantially rigid member;

at least one solderable surface formed on either of said printed circuit board or said optical subassembly defining at least one solder receiving interface between said printed circuit board and said optical subassembly; and

solder material for bonding said subassemblies disposed at said at least one solder-receiving interface.

66. (Amended) An imaging device comprising:

an image sensor subassembly including an image sensor mounted on a printed circuit board;

[an] a substantially rigid optical subassembly, said optical subassembly having a single receive optical axis and including an optical element disposed on a substantially rigid member;

at least one solderable surface formed on either of said image sensor subassembly or optical subassembly defining at least one solder receiving interface between said image sensor subassembly and said optical subassembly; and

solder material for bonding said subassemblies disposed at said at least one solder-receiving interface.

82. (Amended) The method of claim 1, wherein there is further no contact between [sad] said subassemblies which prevents free relative movement between said assemblies in a [z-direction] direction normal to each other.

83. (Amended) The method of claim 13, wherein said subassemblies are further configured to be freely moved in [the z-direction] a direction normal to each other immediately prior to said soldering step.

86. (Amended) The method of claim 46, aligning step further includes the step of moving said subassemblies without contact in a manner that prevents free movement of said subassemblies in a [z-direction] direction normal to each other.

95. (Amended) A method for mounting an optical subassembly of an optical reading or imaging device to an image sensor subassembly of an optical reading or imaging device, said method comprising the steps of:

moving said optical subassembly and said image sensor subassembly in proximity with one another;

aligning said optical subassembly with said image sensor subassembly; and

without a [component part] portion of said image sensor subassembly being in contact with a [component part] portion of said optical subassembly, soldering said optical subassembly and said image sensor [assemblies] assembly together using a solder material.

Attachment B

1. (Amended) A method for mounting an optical subassembly of an optical reading device to an image sensor subassembly of an optical device, said method comprising the steps of:

moving said optical subassembly and said image sensor subassembly in proximity with one another; and

soldering said optical and image sensor assemblies together using a solder material, wherein at the time of said soldering step there is no contact between said optical subassembly and said image sensor subassembly that prevents free movement of said optical subassembly and said image sensor subassembly in either of a vertical or a horizontal direction.

11. (Amended) The method of claim 1, further comprising the step of forming a first solderable surface on one of said subassemblies and a second solderable surface in said other of said subassemblies, wherein said first solderable surface is made in the configuration of a pin driving a substantially uniform-diameter body, and said second solderable surface is made in the configuration of a through-hole, wherein said pin has a diameter smaller than said hole to allow positional adjusting of said optical subassembly relative to said image sensor subassembly.

13. (Amended) A method for mounting an optical subassembly to an image sensor subassembly, said method comprising the steps of:

forming at least one solderable surface on at least one of said optical and image sensor subassemblies;

moving said optical subassembly in proximity with said image sensor subassembly to define an interface delimited by said at least one solderable surface of said optical subassembly or said image sensor subassembly; and

soldering said optical subassembly and said image sensor subassembly together at said interface, wherein said optical subassembly and said image sensor subassembly are configured so that said image sensor subassembly and said optical

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subassembly can be moved freely relative to one another in at least either of a vertical or a horizontal direction immediately prior to said soldering step.

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22. (Amended) The method of claim 13, wherein said forming step includes the step of making a first solderable surface in one of said subassemblies and a second solderable surface in said other of said subassemblies, wherein said first solderable surface is made in the configuration of a pin having a substantially uniform-diameter body, and a said second solderable surface is made in the configuration of a through-hole having a diameter larger than said body.

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26. (Amended) An image sensor subassembly comprising:
a substantially rigid member;
an image sensor chip disposed on said substantially rigid member;
a solderable surface formed on said substantially rigid member, said solderable surface being of a configuration selected from the group consisting of a hole or pin for receiving in surrounding but not engaging relationship a corresponding pin or hole; and a solder material disposed between said pin and said hole.

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45. (Amended) The method of claim 1, wherein said method further comprises the step, after said moving step, of aligning said optical subassembly and image sensor subassembly using a video monitor which displays an output indicative of an output of said image sensor subassembly.

46. (Amended) A method for making an optical and image sensor assembly, said image sensor assembly comprising an optical image sensor subassembly and an image sensor subassembly, said method comprising the steps of:

aligning said optical subassembly and said image sensor subassembly relative to one another without contacting said optical subassembly and said image sensor subassembly against one another in a manner that prevents free movement of

said subassemblies relative to one another in either of a vertical or a horizontal direction; and

when said optical subassembly and said image sensor assembly are properly aligned, securing said optical subassembly and said image sensor subassembly together.

47. (Amended) The method of claim 46, further comprising the step of forming a solderable surface on at least one of said optical subassembly or said image sensor subassembly, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

48. (Amended) The method of claim 46, further comprising the step of forming a solderable surface on at least one of said optical assembly or said image sensor assembly, wherein said forming step includes the step of overmolding non-solderable material onto solderable material to form said solderable surface, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

49. (Amended) The method of claim 46, further comprising the step of forming a solderable surface on at least one of said optical or image sensor subassembly, wherein said forming step includes the step of plating a solderable material onto a non-solderable material, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

50. (Amended) The method of claim 46, further comprising the step of forming a solderable material on at least one of said optical or image sensor subassembly, wherein said forming step includes the step of insert molding solderable material in non-solderable material, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

52. (Amended) The method of claim 46, further comprising the step of forming a solderable surface on at least one of said optical subassembly or said image sensor subassembly, wherein said forming step includes the step of making said solderable surface in an irregular configuration having an increased surface area per unit three dimensional space relative to that of a smooth surface, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

56. (Amended) The method of claim 46, further comprising the step of forming a first solderable surface on one of said optical subassembly or image sensor subassembly and a second solderable surface in said other of said optical subassembly or image sensor subassembly, wherein said first solderable surface is in made in the configuration of a pin, and said second solderable surface is made in the configuration of a hole, wherein said pin has a diameter smaller than said hole to allow positional adjusting of said optical subassembly relative to said image sensor subassembly, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

57. (Amended) The method of Claim 46, further comprising the steps of forming a solderable pin on one of said optical subassembly on image sensor assembly, and making a hole for receiving said pin on the remaining of said subassemblies, and wherein said securing step includes the step of soldering said optical subassembly and said image sensor subassembly together using a solder material.

59. (Amended) An imaging device comprising:
an image sensor subassembly including an image sensor mounted on a printed circuit board;
a substantially rigid optical subassembly, said optical subassembly including an optical element disposed on a substantially rigid member;

at least one solderable surface formed on either of said printed circuit board or said optical subassembly defining at least one solder receiving interface between said printed circuit board and said optical subassembly; and

solder material for bonding said subassemblies disposed at said at least one solder-receiving interface.

66. (Amended) An imaging device comprising:

an image sensor subassembly including an image sensor mounted on a printed circuit board;

a substantially rigid optical subassembly, said optical subassembly having a single receive optical axis and including an optical element disposed on a substantially rigid member;

at least one solderable surface formed on either of said image sensor subassembly or optical subassembly defining at least one solder receiving interface between said image sensor subassembly and said optical subassembly; and

solder material for bonding said subassemblies disposed at said at least one solder-receiving interface.

82. (Amended) The method of claim 1, wherein there is further no contact between said subassemblies which prevents free relative movement between said assemblies in a direction normal to each other.

83. (Amended) The method of claim 13, wherein said subassemblies are further configured to be freely moved in a direction normal to each other immediately prior to said soldering step.

86. (Amended) The method of claim 46, aligning step further includes the step of moving said subassemblies without contact in a manner that prevents free movement of said subassemblies in a direction normal to each other.

95. (Amended) A method for mounting an optical subassembly of an optical reading or imaging device to an image sensor subassembly of an optical reading or imaging device, said method comprising the steps of:

moving said optical subassembly and said image sensor subassembly in proximity with one another;

aligning said optical subassembly with said image sensor subassembly; and

without a portion of said image sensor subassembly being in contact with a portion of said optical subassembly, soldering said optical subassembly and said image sensor assembly together using a solder material.
